

SPECS Climate Prediction for Climate Services: Highlights

F.J. Doblas-Reyes
ICREA and Barcelona Supercomputing Center
Barcelona, Spain

What: to produce quasi-operational and actionable local climate information

Why: need information with improved forecast quality, a focus on extreme climate events and enhanced communication and services for RCOFs, NHMSs and a wide range of public and private stakeholders

How: with a new generation of reliable European climate forecast systems, including initialised ESMs, efficient regionalisation tools and combination methods, and an enhanced dissemination and communication protocol

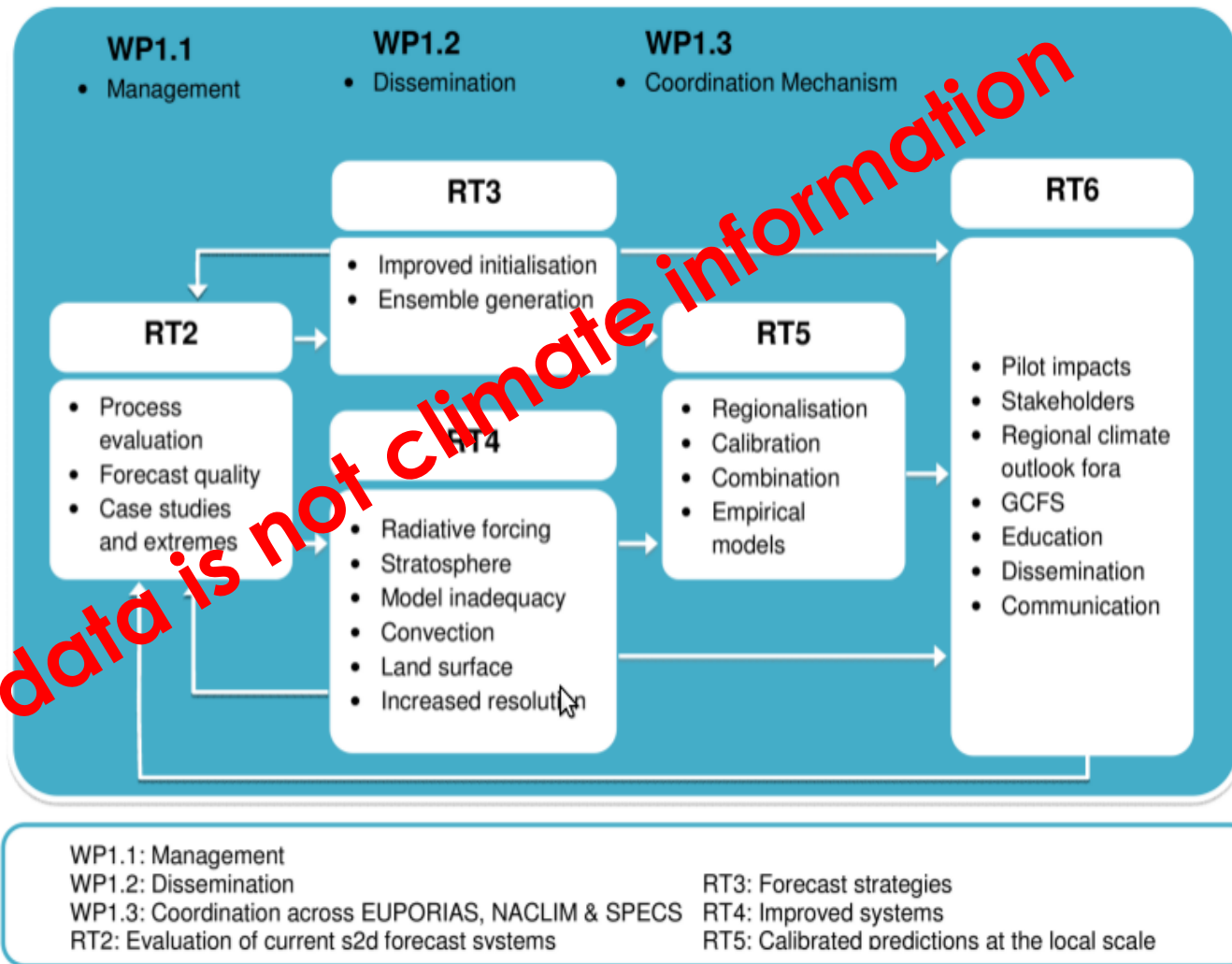
Where: over land, focus on Europe, Africa, South America

When: seasonal-to-decadal time scales over the longest possible observational period

<http://www.specs-fp7.eu>

Strong links to EUPORIAS, but also NACLIM, IS-ENES2, PREFACE, ...

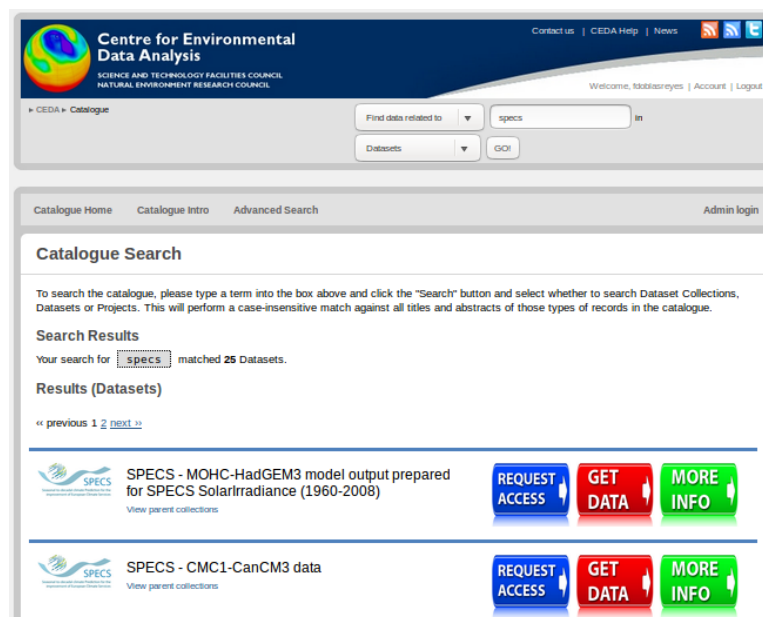
Forecast System	Project Partners
CNRM-CM5	CNRM, CERFACS
EC-Earth	KNMI, SMHI, BSC, ENEA
IFS/NEMO	ECMWF, UOXF
IPSL-CM5	CNRS
MPI-ESM	MPG, Uni-H
UM	UKMET



Tenths of climate prediction experiments, seven models, with different configurations and parameterisations

Focus on both skill improvements and processes (case studies)

130 TB of output (and growing), most of it available from ESGF (a primer in climate prediction), curated in the long term



Data management and experiment documentation are fundamental. They shouldn't be underestimated

Portals are useful, but open access tools allow to go beyond what is initially considered by portal developers

The packages created in SPECS can be better adapted to address specific problems in an interaction with the users

SpecsVerification: Forecast Verification Routines for the SPECS FP7 Project

A collection of new forecast verification routines for the SPECS FP7 project. The emphasis is on comparative verification of ensemble forecasts.

Version: 0.4-1
 Published: 2015-10-23
 Author: Stefan Siegert [aut, cre]
 Maintainer: Stefan Siegert <s.siegert@exeter.ac.uk>
 License: [GPL-2](#) | [GPL-3](#) [expanded from: GPL (≥ 2)]
 NeedsCompilation: yes
 CRAN checks: [SpecsVerification results](#)

Downloads:

Reference manual: [SpecsVerification.pdf](#)
 Package source: [SpecsVerification_0.4-1.tar.gz](#)
 Windows binaries: r-devel: [SpecsVerification_0.4-1.zip](#), r-release: [SpecsVerification_0.4-1.zip](#)
 OS X Mavericks binaries: r-release: [SpecsVerification_0.4-1.tgz](#), r-oldrel: [SpecsVerification_0.4-1.tgz](#)
 Old sources: [SpecsVerification archive](#)

Reverse dependencies:

Reverse depends: [easyVerification](#)
 Reverse imports: [s2dverification](#)

Linking:

Please use the canonical form <https://CRAN.R-project.org/package=SpecsVerification>

s2dverification: Set of Common Tools for Forecast Verification

Set of tools to verify forecasts through the computation of typical prediction scores against one or more observational datasets or reanalyses (a reanalysis being a physical extrapolation of observations that relies on the equations from a model, not a pure observational dataset). Intended for seasonal to decadal climate forecasts although can be useful to verify other kinds of forecasts. The package can be helpful in climate sciences for other purposes than forecasting.

Version: 2.5.0
 Depends: R (≥ 2.14.1), methods, [maps](#)
 Imports: [ncdf4](#), [GEOmap](#), [geomapdata](#), [mapproj](#), [abind](#), parallel, [bigmemory](#), [SpecsVerification](#), [plyr](#)
 Suggests: [easyVerification](#)
 Published: 2016-02-17
 Author: Virginie Guemas [aut], Nicolau Manubens [aut, cre], Louis-Philippe Caron [aut], Verónica Torralba [aut], Chloé Prodhomme [aut], Martin Ménéguez [aut], Javier Garcia-Serrano [aut], Fabian Lienert [aut], Ludovic Auger [aut], Isabel Andreu-Burillo [aut]
 Maintainer: Nicolau Manubens <nicolau.manubens@bsc.es>
 BugReports: <https://earth.bsc.es/gitlab/es/s2dverification/issues>
 License: [GPL-3](#)
 URL: <https://earth.bsc.es/gitlab/es/s2dverification/wikis/home>
 NeedsCompilation: no
 SystemRequirements: cdo
 CRAN checks: [s2dverification results](#)

SantanderMetGroup / downscaleR

Watch 9 Star 12 Fork 19

Code Issues 8 Pull requests 1 Projects 0 Wiki Pulse Graphs

R package for statistical downscaling

4 branches 25 releases 7 contributors

Find file Clone or download -

Latest commit c9882d 2 days ago

in biasCorrection when applying the "delta" method and cross ... 2 days ago

plotClimatology for lattice plots 4 months ago

changes in subsetGrid and man-roxygen/templateObsPredSim 6 months ago

date 12 days ago

ignore update 2 years ago

DESCRIPTION 12 days ago

date 12 days ago

date 16 days ago

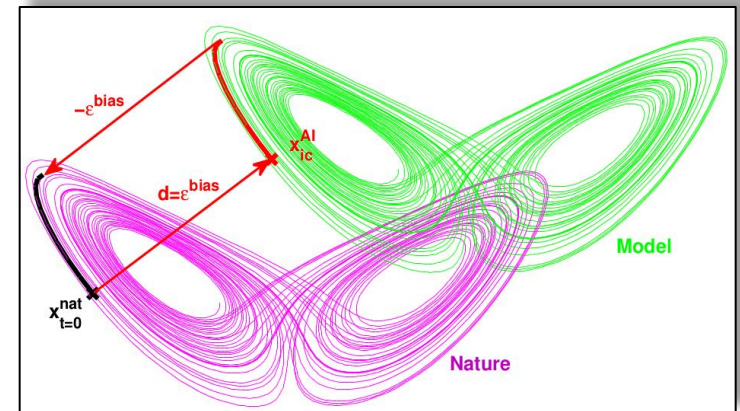
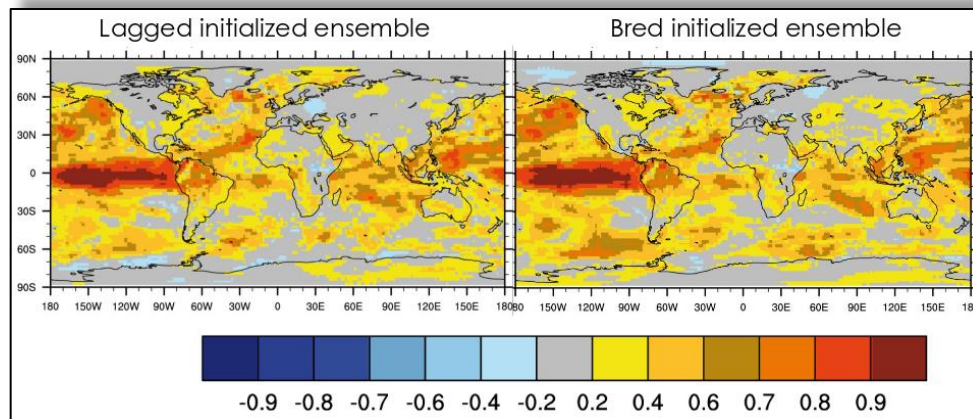
in README file 12 days ago

There is no magic recipe, users should be accompanied to make an efficient use of these tools

Initialisation matters, but the initialisation problem is far from being resolved; the initial condition uncertainty remains large (ocean, land surface and sea ice); better use of data assimilation techniques is needed

The forecast drift is a huge problem that has been characterised; some links between drift and skill have been identified

Simplified models can be very useful to explore solutions like coupled initialisation

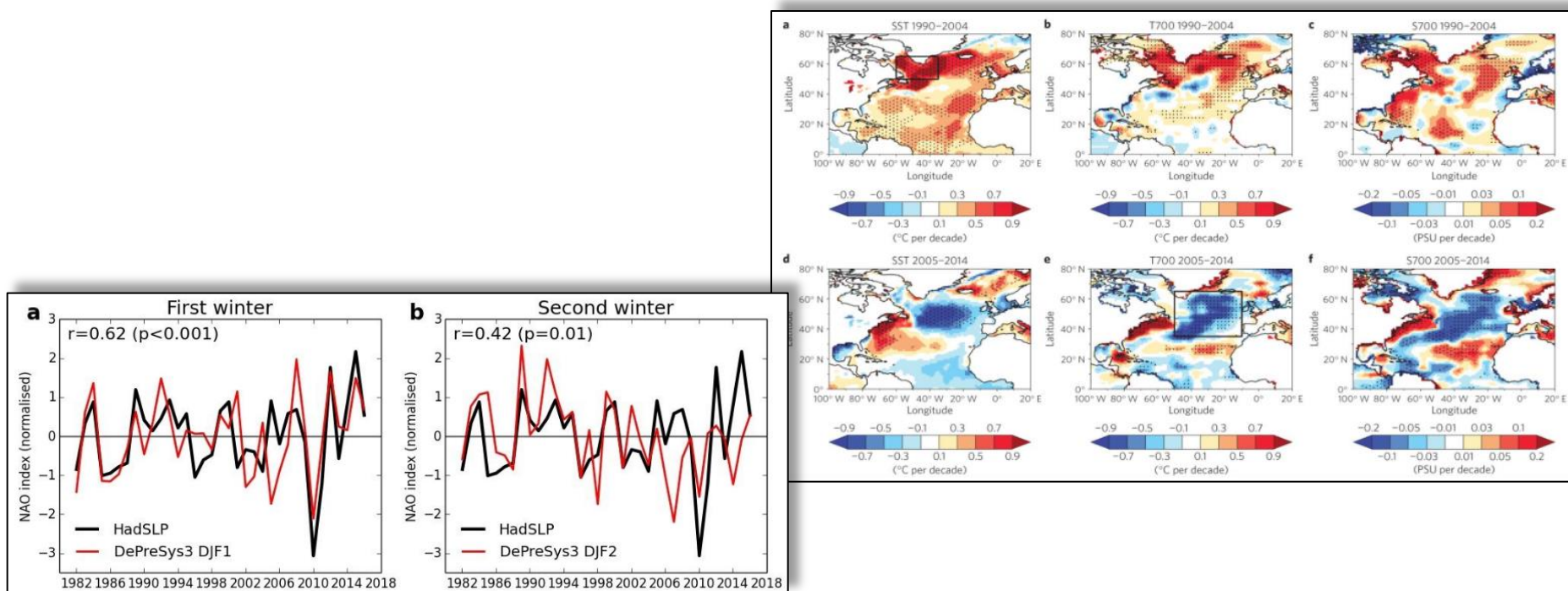


Models predict in a non-stationary state (because of the drift) and the systematic error is too large at times to benefit from good initial conditions

Process understanding

Case studies based on observed extreme events (European summer 2003 and 2010, North Atlantic warming and cooling) have been analysed

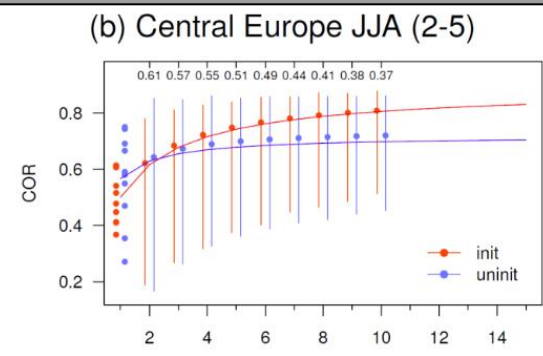
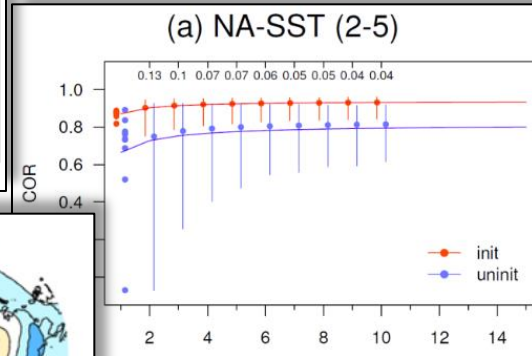
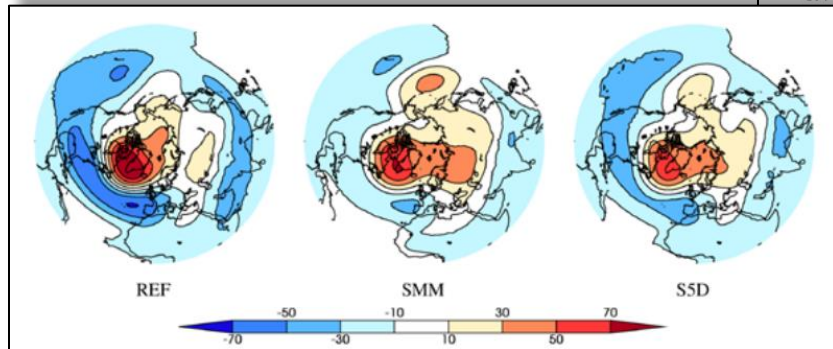
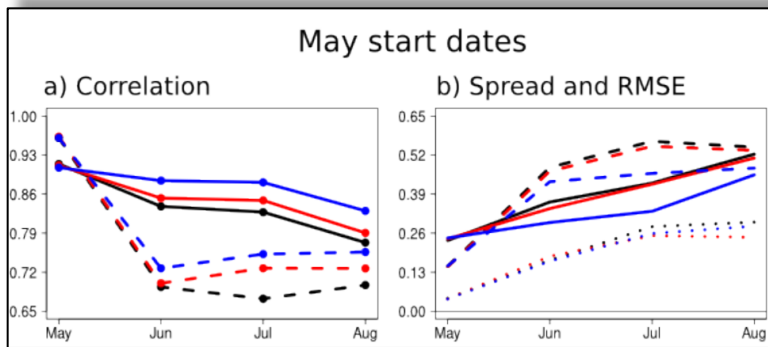
Interesting sources of predictability for some events have been identified



The process-based analysis of hits, misses and false alarms help improving the forecast systems if it is done in a coordinated multi-model context

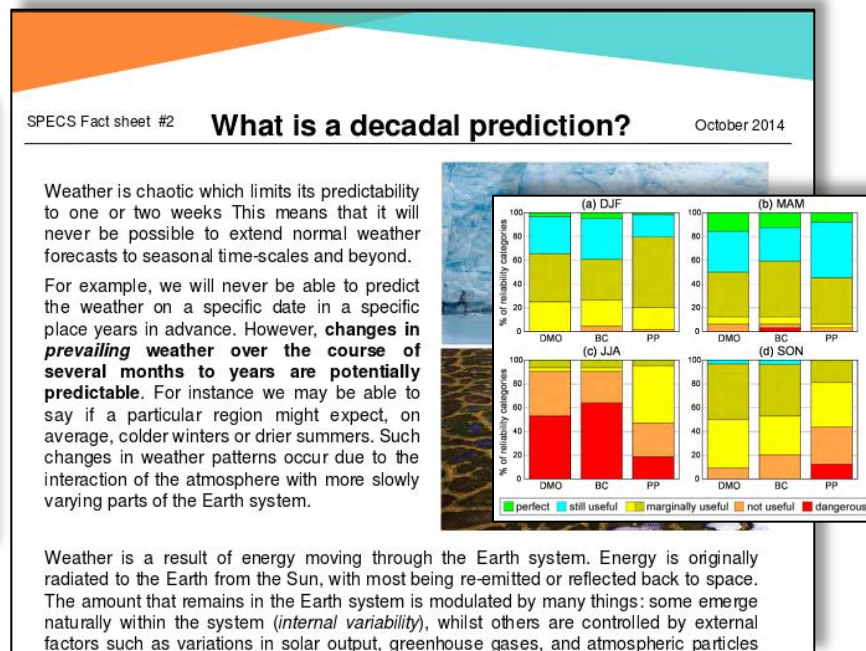
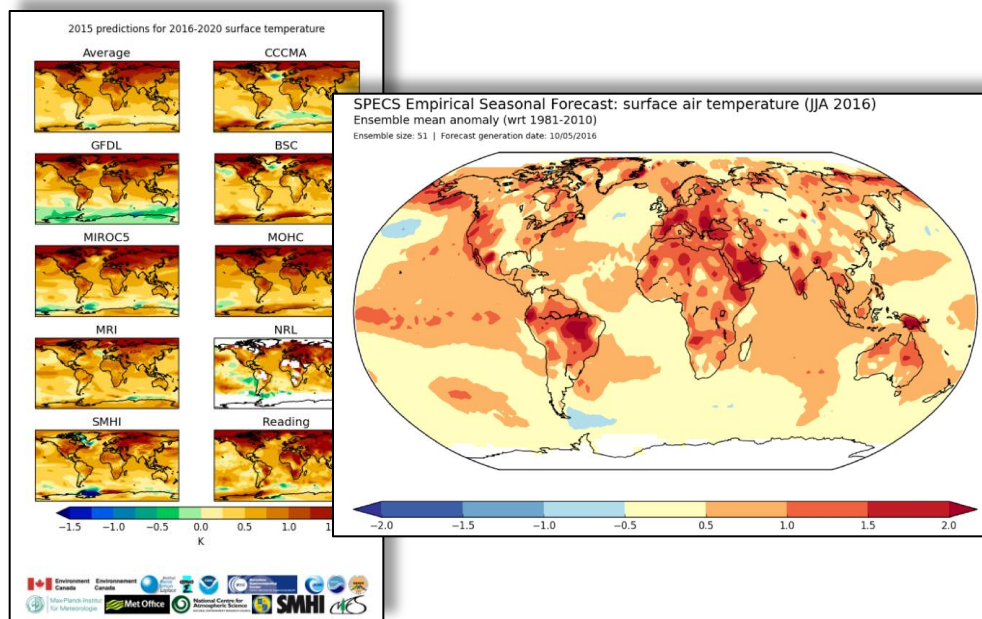
Improvements in the resolution, vegetation treatment, stochastic parameterisations, initialisation, sampling (ensemble and hindcast size), ...

Improvements in forecast quality are found, but statistical significance is an issue



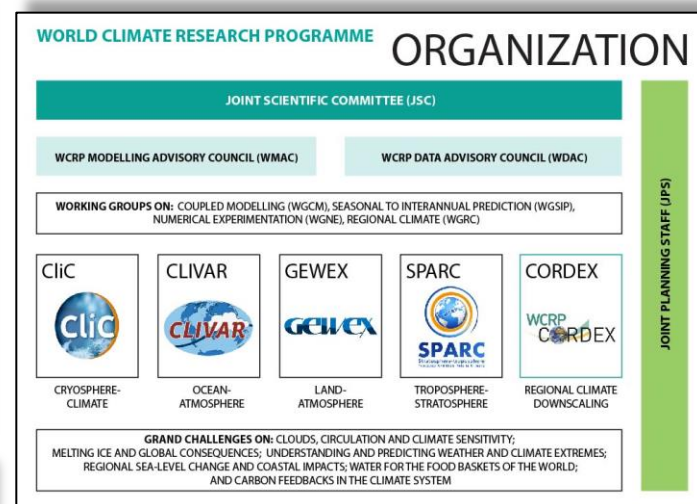
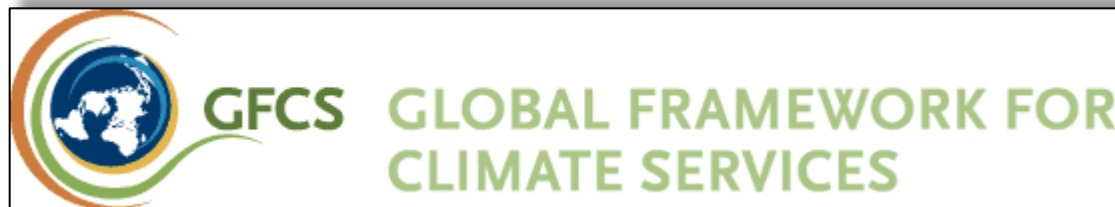
Improving the forecast systems takes long time; need to focus on those aspects that have a stronger impact for a wide range of users (e-g- NAO)

The operationalisation of decadal forecasts, the creation of robust empirical benchmarks, the exhaustive illustration of the (limited) benefits of downscaling and model combination, the generation of entry-level documentation, have been rewarding aspects of the project activity



Multidisciplinary is fundamental in climate services, and this should include climate modellers and forecasters, which requires profiles that are not readily available

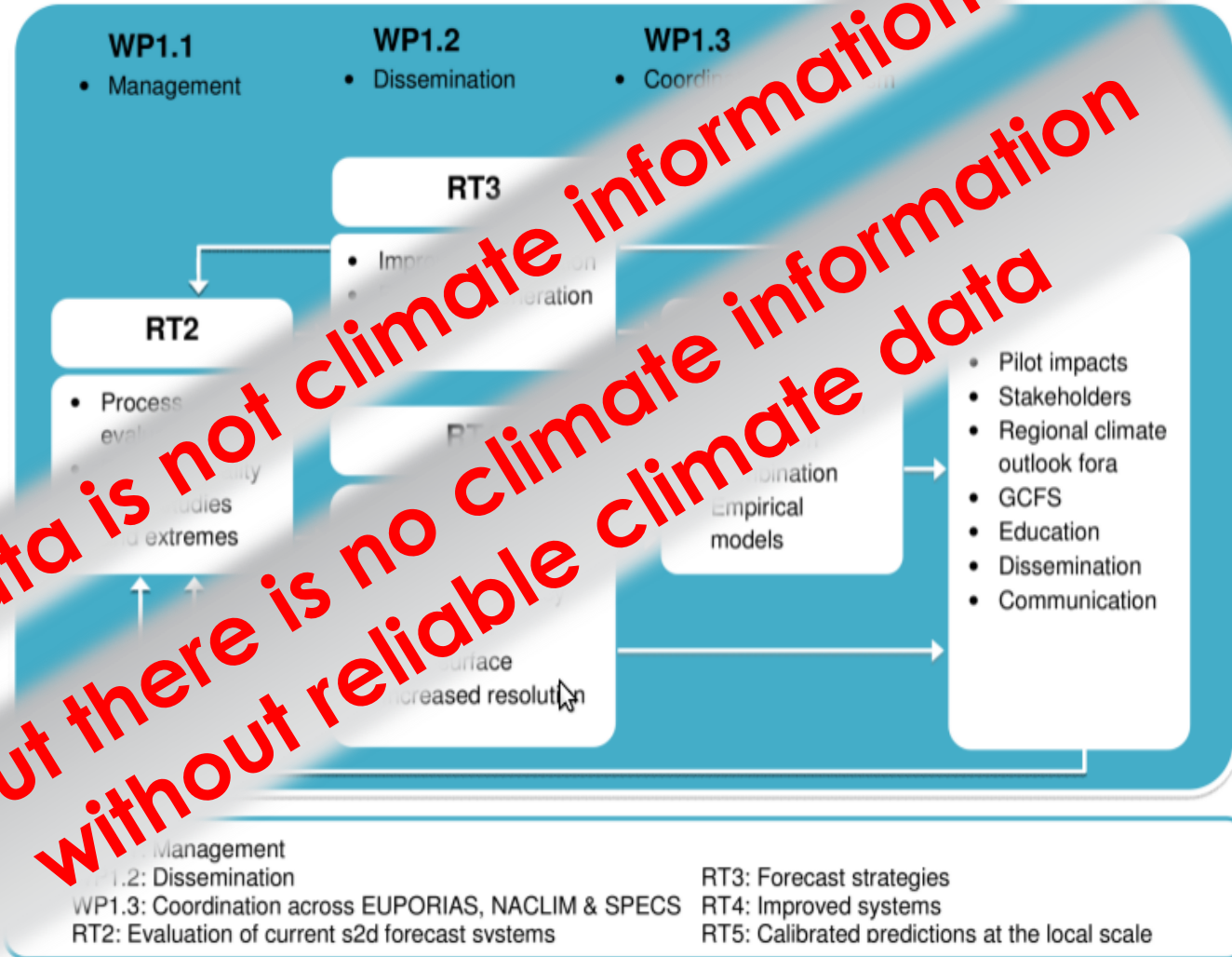
SPECS has tried to make a difference in engaging with multiple communities like WCRP (WGSIP drift project), Polar Prediction Project (role of sea ice and snow in climate prediction), GFCS (tools and examples for the RCOFs), Copernicus (verification and standards), ...



The sustainability of the outcome of research projects in an international context can be ensured by the operationalisation of their conclusions

Strong links to EUPORIAS, but also NACLIM, IS-ENES2, PREFACE, ...

Forecast System	Project Partners
CNRM-CM5	CNRM, CERFACS
EC-Earth	KNMI, SMHI, BSC, ENEA
IFS/NEMO	ECMWF, UOXF
IPSL-CM5	CNRS
MPI-ESM	MPG, UniHH
UM	UM



SPECS Climate Prediction for Climate Services